points; and

means for superimposing on the electric current signal one or more waveforms of given frequency and amplitude, thereby to generate a complex signal.

11. *(New)* Apparatus according to claim 10, comprising:

means for creating an electric potential between at least a pair of electrodes in the vicinity of the cardiac muscle at at least two root locations;

means for causing a non-excitatory electric current signal to flow between said at least two root locations;

means for controlling the start time, duration and magnitude of the electric current signal flowing between said at least two root locations; and

means for superimposing on the electric current signal one or more waveforms of given frequency and amplitude, thereby to generate a complex signal.

12. *(New)* Apparatus comprising circuitry for creating a non-excitatory electric potential between at least two points located in the vicinity of a muscle, comprising circuitry for controlling the start time and/or the duration of the electric potential generated between said at least two points which is synchronized to heart activity, said circuitry not operating at

every beat of the heart.

13. *(New)* Implantable apparatus comprising circuitry for causing a non-excitatory electric current to flow between at least two points located in the vicinity of a muscle and circuitry for controlling the start time and/or duration of the electric current, wherein said circuitry for controlling does not operate at every beat of the heart.

14. *(New)* Apparatus for selectively and reversibly reducing the oxygen consumption of an area of a muscle, comprising circuitry for creating a non-excitatory electric potential between at least two points located in the vicinity of the muscle, and comprising circuitry for controlling the start time and/or duration of the electric current flowing between said at least two points which is synchronized to heart activity, said circuitry not operating at every beat of the heart.

15. *(New)* Apparatus for reducing the contraction force of a muscle, comprising:

means for creating an electric potential between at least two points located in the vicinity of the muscle;

means for causing a non-excitatory DC electric current to flow between said at least two point, if desired; and

means for controlling the start time, duration and magnitude of the non-excitatory electric potential and/or of the non-excitatory electric current flowing between said at least two points.

16. *(New)* Apparatus according to claim 15, comprising:

means for creating an electric potential between at least a pair of electrodes in the vicinity of the muscle at at least two root locations;

means for causing a non-excitatory DC electric current to flow between said at least two root locations when desired; and

means for controlling the start time, duration and magnitude of the non-excitatory electric potential and/or of the non-excitatory electric current flowing between said at least two root locations.

17. *(New)* A method for reducing the contraction force of a muscle, comprising creating a non-excitatory electric potential between at least two points located in the vicinity of the muscle, and controlling one or more of the parameters consisting of start time, duration, magnitude and polarity of the non-excitatory electric potential created between said at least two points.

18. *(New)* A method for reducing the contraction force of a muscle, comprising causing a non-excitatory electric current to flow between at least two points located in the vicinity of the muscle, and controlling one or more of the parameters consisting of start time, duration, magnitude and polarity of the non-excitatory electric current flowing between said at least two points.

19. *(New)* A method according to claim 17 or 18, wherein the muscle is a cardiac muscle.

20. *(New)* A method according to claim 18, wherein the non-excitatory electric current is a DC current.

21. *(New)* A method according to claim 20, further comprising generating a complex signal by superimposing on the DC signal one or more waveforms of given frequency and amplitude.

22. *(New)* A method according to claim 18, wherein the flow of the non-excitatory DC electric current is synchronized to heart activity.

23. *(New)* A method according to claim 22, wherein the non-excitatory DC electric current flows not at every beat of the heart.

24. *(New)* A method for performing heart treatment, comprising reducing the contraction force of a treated area of the cardiac muscle, by creating a non-excitatory electric potential between at least two points located in the vicinity of the muscle, and controlling one or more of the parameters consisting of start time, duration, magnitude and polarity of the non-excitatory electric potential created between said at least two points, thereby to obtain the desired reduction in muscle contraction at the treated heart area and thereafter performing surgery thereon.

25. *(New)* A method for performing heart treatment, comprising reducing the contraction force of a treated area of the cardiac muscle, by causing a non-excitatory electric current to flow between at least two points located in the vicinity of the muscle, and controlling one or more of the parameters consisting of start time, duration, magnitude and polarity of the non-excitatory electric current flowing between said at least two points, thereby to obtain the desired reduction in muscle contraction at the treated heart area and thereafter performing surgery thereon.

26. *(New)* A method according to claim 24 or 25, wherein the heart surgery is a bypass operation.

27. *(New)* A method according to claim 24 or 25, wherein the heart surgery is a minimally invasive cardiac operation.

28. *(New)* A method for promoting the healing of the cardiac muscle after myocardial infarct, comprising creating a non-excitatory electric potential between at least two points located in the vicinity of the muscle, and controlling one or more of the parameters consisting of start time, duration, magnitude and polarity of the non-excitatory electric potential created between said at least two points, said electric potential being of an intensity and polarity suitable to obtain the desired reduction in muscle contraction at the affected heart area.

29. *(New)* A method for promoting the healing of the cardiac muscle after myocardial infarct, comprising causing a non-excitatory electric current to flow between at least two points located in the vicinity of the muscle, and controlling one or more of the parameters consisting of start time, duration, magnitude and polarity of the non-excitatory electric current flowing between said at least two points, said electric current being of an intensity and polarity suitable to obtain the desired reduction in muscle contraction at the affected heart area.

30. *(New)* A method for selectively and reversibly reducing

the oxygen consumption of an area of a muscle, comprising causing a non-excitatory electric current to flow between at least two points located in the vicinity of the muscle, and controlling one or more of the parameters consisting of start time, duration, magnitude and polarity of the non-excitatory electric current flowing between said at least two points, said electric current being of an intensity and polarity suitable to obtain the desired reduction in oxygen consumption at the affected heart area.

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31. *(New)* A method for selectively and reversibly reducing the oxygen consumption of an area of a muscle, comprising creating a non-excitatory electric potential between at least two points located in the vicinity of the muscle, and controlling one or more of the parameters consisting of start time, duration, magnitude and polarity of said non-excitatory electric potential, said electric potential being of an intensity and polarity suitable to obtain the desired reduction in oxygen consumption at the affected heart area.

32. *(New)* A method for treating congenital or acquired hypertrophic cardiomyopathy, comprising reducing the contraction force of the heart muscle by creating a non-excitatory electric potential between at least two points located in the vicinity of the muscle, and controlling one or more of the parameters

consisting of start time, duration, magnitude and polarity of the non-excitatory electric potential created between said at least two points, said electric potential being of an intensity and polarity suitable to obtain the desired reduction in muscle contraction.

33. *(New)* A method for treating congenital or acquired hypertrophic cardiomyopathy, comprising reducing the contraction force of the heart muscle by causing a non-excitatory electric current to flow between at least two points located in the vicinity of the muscle, and controlling one or more of the parameters consisting of start time, duration, magnitude and polarity of the non-excitatory electric current flowing between said at least two points, said electric current being of an intensity and polarity suitable to obtain the desired reduction in muscle contraction.

34. *(New)* A method for performing cardiac treatment, comprising reducing the contraction force of the area of the cardiac muscle to be ablated, by creating a non-excitatory electric potential between at least two points located in the vicinity of the muscle, and controlling one or more of the parameters consisting of start time, duration, magnitude and polarity of the non-excitatory electric potential created between

said at least two points, thereby to obtain the desired reduction in muscle contraction at the heart area to be ablated, and thereafter performing the ablation thereon.

35. *(New)* A method for performing cardiac treatment, comprising reducing the contraction force of the area of the cardiac muscle to be ablated, by causing a non-excitatory electric current to flow between at least two points located in the vicinity of the muscle, and controlling one or more of the parameters consisting of start time, duration, magnitude and polarity of the non-excitatory electric current flowing between said at least two points, thereby to obtain the desired reduction in muscle contraction at the heart area to be ablated, and thereafter performing the ablation thereon.

36. *(New)* A method according to any one of claims 25, 29, 30, 33 or 35, wherein the non-excitatory electric current is a DC current.

37. *(New)* A method according to claim 36, further comprising generating a complex signal by superimposing on the DC signal one or more waveforms of given frequency and amplitude.

38. *(New)* A method according to any one of claims 25, 29, 30, 33 or 35, wherein the flow of the non-excitatory DC electric

current is synchronized to heart activity.

39. *(New)* A method according to claim 38, wherein the non-excitatory DC electric current flows not at every beat of the heart.

40. *(New)* A method according to any one of claims 25 and 28 to 33, wherein the cardiac muscle contractility is increased at locations other than the treated location.

41. *(New)* A method for the interim treatment of a heart in need of reducing oxygen consumption, comprising reducing the contraction force of the heart muscle by creating a non-excitatory electric potential between at least two points located in the vicinity of the muscle, of an intensity and polarity suitable to obtain the desired reduction in muscle contraction at the treated heart area, thereby reducing the oxygen consumption of the heart.

42. *(New)* A method for the interim treatment of heart in need of reducing oxygen consumption, comprising reducing the contraction force of a the heart muscle by causing a non-excitatory electric current to flow between at least two points located in the vicinity of the muscle, of an intensity and polarity suitable to obtain the desired reduction in muscle

contraction at the treated heart area, thereby reducing the oxygen consumption of the heart.

43. *(New)* A method according to claim 42, wherein the non-excitatory electric current is a DC current.

44. *(New)* A method according to claim 43, further comprising generating a complex signal by superimposing on the DC signal one or more waveforms of given frequency and amplitude.

45. *(New)* A method according to claim 42, wherein the flow of the non-excitatory DC electric current is synchronized to heart activity.

46. *(New)* A method according to claim 45, wherein the non-excitatory DC electric current flows not at every beat of the heart.

47. *(New)* A method for reducing the contraction force of a muscle, comprising:

providing means for creating an electric potential between at least two points located in the vicinity of the muscle;

providing means for causing a non-excitatory DC electric current to flow between said at least two point;

providing means for switching the current polarity between

said at least two points; and

providing means for controlling the start time, duration and magnitude of the electric current flowing between said at least two points.

48. *(New)* A method according to claim 40, comprising:

providing an electric potential between at least a pair of electrodes in the vicinity of the muscle at at least two root locations;

causing a non-excitatory DC electric current to flow between said at least two contacting locations;

providing means for switching the current polarity between said root locations; and

controlling the start time, duration and magnitude of the electric current flowing between said at least two root locations, so as to obtain the desired reduction in muscle contraction.

49. *(New)* A method according to claim 47 or 48, further comprising generating a complex signal by superimposing on the DC signal one or more waveforms of given frequency and amplitude.

50. *(New)* A method according to claim 47 or 48, wherein the means for causing a non-excitatory DC electric current to flow,

are synchronized to heart activity.

51. *(New)* A method according to claim 50, wherein the means for causing a non-excitatory DC electric current to flow operate not at every beat of the heart.

52. *(New)* Apparatus for performing heart treatment, comprising circuitry for creating a non-excitatory electric potential between at least two points located in the vicinity of the heart muscle and circuitry for controlling the start time and/or duration of electric current flowing between said at least two points which is synchronized to heart activity, wherein said circuitry for controlling does not operate at every beat of the heart.

53. *(New)* Apparatus for promoting the healing of the hibernated area of the cardiac muscle after myocardial infarct, comprising circuitry for creating a non-excitatory electric potential between at least two points located in the vicinity of the muscle, comprising circuitry for controlling the start time and/or duration of the electric current flowing between said at least two points which is synchronized to heart activity, said circuitry not operating at every beat of the heart.

54. *(New)* Apparatus for promoting the healing of an

ischmeic area of the cardiac muscle, comprising circuitry for creating a non-excitatory electric potential between at least two points located in the vicinity of the muscle, comprising circuitry for controlling the start and/or duration of the electric current flowing between said at least two points which is synchronized to heart activity, said circuit not operating at every beat of the heart.

55. *(New)* Apparatus for treating congenital or acquired hypertrophic cardiomyopathy, comprising circuitry for creating a non-excitatory electric potential between at least two points located in the vicinity of the muscle, comprising circuitry for controlling the start time and/or duration of the electric current flowing between said at least two points which is synchronized to heart activity, said current not operating at every beat of the heart.

56. *(New)* Apparatus for aiding in performing cardiac treatment, comprising circuitry for creating a non-excitatory electric potential between at least two points located in the vicinity of the muscle, comprising circuitry for controlling the start time and/or duration of the electric current flowing between said at least two points which is synchronized to heart activity, said circuitry not operating at every beat of the

heart.

57. *(New)* Apparatus according to any one of claims 14, 52, and 53-56, wherein the non-excitatory electric current is a DC current, further comprising signal generation circuitry for superimposing on the DC signal one or more waveforms of given frequency and amplitude, thereby to generate a complex signal. --